acm computing surveys

Volumes 21–25 • 1989–1993

The Survey and Tutorial Journal of the ACM

CONTENTS

Vols. 21–25

Author Index

Abbott, R. J. Resourceful Systems for Fault Tolerance, Reliability, and Safety. Vol. 22, No. 1 (March 1990), 35–68.

Abbott, R. J. Surveyor's Forum: Response to Strigini's comments on "Resourceful Systems for Fault Tolerance, Reliability, and Safety." Vol. 23, No. 3 (Sept. 1991), 409–411.

Abeysundara, B. W., and **Kamal, A. E.** High-Speed Local Area Networks and Their Performance: A Survey. Vol. 23, No. 2 (June 1991), 221–264.

Abramson, B. Control Strategies for Two-Player Games. Vol. 21, No. 2 (June 1989), 137–161.

Adam, N. R., and **Wortmann, J. C.** Security-Control Methods for Statistical Databases: A Comparative Study. Vol. 21, No. 4 (Dec. 1989), 515–556.

Aggarwal, J. K. See Arman, F. Vol. 25, No. 2 (March 1993), 5–43.

Ahuja, N. See Hwong, Y. K. Vol. 24, No. 3 (Sept. 1992), 219–291.

Andrews, G. R. Paradigms for Process Interaction in Distributed Programs. Vol. 23, No. 1 (March 1991), 49–90.

Arman, F., and **Aggarwal, J. K.** Model-Based Object Recognition in Dense-Range Images: A Review. Vol. 25, No. 1 (March 1993), 5–43.

Aurenhammer, I. Voronoi Diagrams—A Survey of a Fundamental Geometric Data Structure. Vol. 23, No. 3 (Sept. 1991), 345–406.

Bal, H. E., Steiner, J. G., and **Tanenbaum, A. S.** Programming Languages for Distributed Computing Systems. Vol. 21, No. 3 (Sept. 1989), 261–322.

Barborak, M., Malek, M., and **Dahbura, A.** The Consensus Problem in Fault-Tolerant Computing. Vol. 25, No. 2 (June 1993), 171–220.

Barghouti, N. S., and **Kaiser, G. E.** Concurrency Control in Advanced Database Applications. Vol. 23, No. 3 (Sept. 1991), 269–318.

Barkmeyer, E. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.

Baskerville, R. Information Systems Security Design Methods: Implications for Information Systems Development. Vol. 25, No. 4 (Dec. 1993), 375–414.

Bell, T., Witten, I. H., and **Cleary, J. G.** Modeling for Text Compression. Vol. 21, No. 4 (Dec. 1989), 557–599.

Brancheau, J. C., and **Brown, C. V.** The Management of End-User Computing: Status and Directions. Vol. 25, No. 4 (Dec. 1993), 437–482.

Brinch Hansen, P. Householder Reduction of Linear Equations. Vol. 24, No. 2 (June 1992), 185–194.

Brown, C. V. See Brancheau, J. C. Vol. 25, No. 4 (Dec. 1993), 437–482.

Brown, L. G. A Survey of Image Registration Techniques. Vol. 24, No. 4 (Dec. 1992), 325–376.

Bryant, R. E. Symbolic Boolean Manipulation with Ordered Binary-Decision Diagrams, Vol. 24, No. 3 (Sept. 1992), 293–318.

Carriero, N., and **Gelernter, D.** How to Write Parallel Programs: A Guide to the Perplexed. Vol. 21, No. 3 (Sept. 1989), 323–357.

Carter, F. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.

Chanson, S. T. See Chin, R. S. Vol. 23, No. 1 (Mar. 1991), 91–124.

Chin, R. S., and **Chanson, S. T.** Distributed Object-Based Programming Systems. Vol. 23, No. 1 (March 1991), 91–124.

Chung, C.-W. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.

Cleary, J. G. See Bell, T. Vol. 21, No. 4 (Dec. 1989), 557–591.

Colburn, C. J., and **Van Oorschot, P. C.** Applications of Combinatorial Designs in Computer Science. Vol. 21, No. 2 (June 1989), 223–250.

Dahbura, A. See Barborak, M. Vol. 25, No. 2 (June 1993), 171–220.

Dunham, C. B. Surveyors' Forum. Vol. 24, No. 3 (Sept. 1992), 319.

Eich, M. H. See Mishra, P. Vol. 24, No. 1 (March 1992), 63–113.

Ellman, T. Explanation Based Learning: A Survey of Programs and Perspectives. Vol. 21, No. 2 (June 1989), 163–221.

Elmagarmid, A. K. and **Pu, C.** Introduction to the Special Issue on Heterogeneous Databases. Vol. 22, No. 3 (Sept. 1990), 175–178.

Eschermann, B. State Assignment for Hardwired VLSI Control Units. Vol. 25, No. 4 (Dec. 1993), 415–436.
Estivill-Castro, V., and **Wood, D.** A Survey of Adaptive Sorting Algorithms. Vol. 24, No. 4 (Dec. 1992), 441–476.
Fox, S. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.
Frieder, G. See Stytz, M. R. Vol. 23, No. 4 (Dec. 1991), 421–500.
Frieder, O. See Stytz, M. R. Vol. 23, No. 4 (Dec. 1991), 421–500.
Fua, P. See Suetens, P. Vol. 24, No. 1 (March 1992), 5–61.
Galil, Z. and **Italiano, G. F.** Data Structures and Algorithms for Disjoint Set Union Problems. Vol. 23, No. 3 (Sept. 1991), 319–344.
Gelernter, D. See Carriero, N. Vol. 21, No. 3 (Sept. 1989), 323–357.
Goldberg, D. What Every Computer Scientist Should Know About Floating-Point Arithmetic. Vol. 23, No. 1 (March 1991), 5–48.
Graefe, G. Query Evaluation Techniques for Large Databases. Vol. 25, No. 2 (June 1993), 73–170.
Hanson, A. J. See Suetens, P. Vol. 24, No. 1 (March 1992), 5–61.
Hartman, B. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.
Hartson, H. R., and **Hix, D.** Human–Computer Interface Development: Concepts and Systems. Vol. 21, No. 1 (Mar. 1989), 5–92.
Helmbold, D. P. See McDowell, D. E. Vol. 21, No. 4 (Dec. 1989), 593–622.
Hix, D. See Hartson, H. R. Vol. 21, No. 1 (Mar. 1989), 5–92.
Hudak, P. Conception, Evolution, and Application of Functional Programming Languages. Vol. 21, No. 3 (Sept. 1989), 359–411.
Hwong, Y. K., and **Ahuja, N.** Gross Motion Planning—A Survey. Vol. 24, No. 3 (Sept. 1992), 219–291.
Italiano, G. F. See Galil, Z. Vol. 23, No. 3 (Sept. 1991), 319–344.
Kaiser, G. E. See Barghouti, N. S. Vol. 23, No. 3 (Sept. 1991), 269–318.
Kamal, A. E. See Abeysundara, B. W. Vol. 23, No. 2 (June 1991), 221–264.
Katz, R. H. Toward a Unified Framework for Version Modeling in Engineering Databases. Vol. 22, No. 4 (Dec. 1990), 375–408.
Knight, K. Unification: A Multidisciplinary Survey. Vol. 21, No. 1 (Mar. 1989), 93–124.
Krueger, C. Software Reuse. Vol. 24, No. 2 (June 1992), 131–183.
Kukich, K. Techniques for Automatically Correcting Words in Text. Vol. 24, No. 4 (Dec. 1992), 377–440.
Larson, J. A. See Sheth, A. P. Vol. 22, No. 3 (Sept. 1990), 184–236.
Levy, E., and **Silberschatz, A.** Distributed File Systems: Concepts and Examples. Vol. 22, No. 4 (Dec. 1990), 321–374.
Lilja, D. J. Cache Coherence in Large-Scale Shared-Memory Multiprocessors: Issues and Comparisons. Vol. 25, No. 3 (Sept. 1993), 303–338.
Litwin, W., Mark, L., and **Roussopoulos, N.** Interoperability of Multiple Autonomous Databases. Vol. 22, No. 3 (Sept. 1990), 267–293.
Malek, M. See Barborak, M. Vol. 25, No. 2 (June 1993), 171–220.
Mandl, R. Surveyors' Forum. Vol. 22, No. 2 (June 1990), 171.
March, S. T. Editorial Policy. Vol. 21, No. 2 (June 1989), 129–136.
March, S. T. Editorial Policy. Vol. 22, No. 2 (June 1990), 73–81.
March, S. T. Editorial Policy. Vol. 23, No. 2 (June 1991), 133–141.
March, S. T. Editorial Policy. Vol. 24, No. 2 (June 1992), 117–125.
Mark, L. See Litwin, W. Vol. 22, No. 3 (Sept. 1990), 267–293.
Mazumder, P. See Shahookan, K. Vol. 23, No. 2 (June 1991), 143–220.
McDowell, C. E., and **Helmbold, D. P.** Debugging Concurrent Programs. Vol. 21, No. 4 (Dec. 1989), 593–622.
McGeoch, C. Analyzing Algorithms by Simulation: Variance Reduction Techniques and Simulation Speedups. Vol. 24, No. 2 (June 1992), 195–212.
McKenzie, L. E., and **Snodgrass, R. T.** An Evaluation of Relational Algebras Incorporating the Time Dimension in Databases. Vol. 23, No. 4 (Dec. 1991), 501–543.
Mishra, P., and **Eich, M. H.** Join Processing in Relational Databases. Vol. 24, No. 1 (March 1992), 63–113.
Muntz, R. R. A Personal Note. Vol. 24, No. 3 (Sept. 1992), 213–214.
Nelson, R. D. The Mathematics of Product Form Queuing Networks. Vol. 25, No. 3 (Sept. 1993), 339–369.
Norman, M. G., and **Thanisch, P.** Models of Machines and Computation for Mapping in Multicomputers. Vol. 25, No. 3 (Sept. 1993), 263–302.

Onvural, R. O. Survey of Closed Queueing Networks with Blocking. Vol. 22, No. 2 (June. 1990), 83–121.
Pawlikowski, K. Steady-State Simulation of Queueing Processes: A Survey of Problems and Solutions. Vol. 22, No. 2 (June 1990), 124–170.
Peckham, J., and Maryanski, F. Semantic Data Models. Vol. 20, No. 3 (Sept. 1988), 153–189.
Pu, C. See Elmagarmid, A. K. Vol. 22, No. 3 (Sept. 1990), 175–178.
Rosenblum, D. S. See Sankar, S. Vol. 23, No. 1 (March 1991), 125–127.
Roussopoulos, N. See Litwin, W. Vol. 22, No. 3 (Sept. 1990), 267–293.
Sankar, S., and Rosenblum, D. S. Surveyor's Forum: Routine Checking and Debugging of Formally Specified Programs. Vol. 23, No. 1 (March 1991), 125–127.
Schneider, F. B. Implementing Fault-Tolerant Services Using the State Machine Approach: A Tutorial. Vol. 22, No. 4 (Dec. 1990), 299–319.
Schneider, M. Self-Stabilization. Vol. 25, No. 1 (March 1993), 45–67.
Shahookar, K., and Mazumder, P. VLSI Placement Techniques. Vol. 23, No. 2 (June 1991), 143–220.
Shankar, A. U. An Introduction to Assertional Reasoning for Concurrent Systems. Vol. 25, No. 3 (Sept. 1993), 225–262.
Shapiro, E. Corrigendum. Vol. 21, No. 4 (Dec. 1989), 629.
Shapiro, E. The Family of Concurrent Logic Programming Languages. Vol. 21, No. 3 (Sept. 1989), 413–510.
Sheth, A. P., and Larson, J. A. Federated Database Systems for Managing Distributed, Heterogeneous, and Autonomous Databases. Vol. 22, No. 3 (Sept. 1990), 184–236.
Silberschatz, A. See Levy, E. Vol. 22, No. 4 (Dec. 1990), 321–374.
Snodgrass, R. T. See McKenzie, L. E. Vol. 23, No. 4 (Dec. 1991), 501–543.
Steiner, J. G. See Bal, H. E. Vol. 21, No. 3 (Sept. 1989), 261–322.
Strigini, L. Surveyor's Forum: Comments on "Resourceful Systems for Fault Tolerance, Reliability and Safety". Vol. 23, No. 3 (Sept. 1991), 407–409.
Stytz, M. R., Frieder, G., and Frieder, O. Three-Dimensional Medical Imaging: Algorithms and Computer Systems. Vol. 23, No. 4 (Dec. 1991), 421–500.
Suetens, P., Fua, P., and Hanson, A. J. Computational Strategies for Object Recognition. Vol. 24, No. 1 (March 1992), 5–61.
Tanenbaum, A. S. See Bal, H. E. Vol. 21, No. 3 (Sept. 1989), 261–322.
Templeton, M. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.
Thanisch, P. See Norman, M. G. Vol. 25, No. 3 (Sept. 1993), 263–302.
Thomas, G., Thompson, G. R., Chung, C.-W., Barkmeyer, E., Carter, F., Templeton, M., Fox, S., and Hartman, B. Heterogeneous Distributed Database Systems for Production Use. Vol. 22, No. 3 (Sept. 1990), 237–266.
Thompson, G. R. See Thomas, G. Vol. 22, No. 3 (Sept. 1990), 237–266.
Van de Goor, A. J., and Verruijt, C. A. An Overview of Deterministic Functional RAM Chip Testing. Vol. 22, No. 1 (Mar. 1990), 5–33.
Van Oorshot, P. C. See Colbourn, C. J. Vol. 21, No. 2 (June 1989), 223–250.
Verruijt, C. A. See Van de Goor, A. J. Vol. 22, No. 1 (Mar. 1990), 5–33.
Wegner, P. Introduction to the Special Issue on Programming Language Paradigms. Vol. 21, No. 3 (Sept. 1989), 253–258.
Wichmann, B. A. Surveyors' Forum. Vol. 24, No. 3 (Sept. 1992), 319.
Witten, I. H. See Bell, T. Vol. 21, No. 4 (Dec. 1989), 557–591.
Wood, D. See Estivill-Castro, V. Vol. 24, No. 4 (Dec. 1992), 441–476.
Wortmann, J. C. See Adam, N. R. Vol. 21, No. 4 (Dec. 1989), 515–556.

Subject Index 1989–1993

Algorithms

Galil and Italiano	September 1991
Aurenhammer	September 1991
McGeoch	June 1992
Bryant	September 1992
Estivill-Castro and Wood	December 1992

Artificial Intelligence

Abramson	June 1989
Ellman	June 1989
Kukich	December 1992

Computer Architecture; IC Design

Van de Goor and Verruijt	March 1990
Shahookar and Mazumder	June 1991

Computer System Design

Goldberg	March 1991
Lilja	September 1993
Eschermann	December 1993

Computer Systems Management

Baskerville	December 1993

Computing Methodologies

Knight	March 1989

Data Communications and Networks

Abeysundara and Kamal	June 1991

Database Management

Adam and Wortmann	December 1989
Sheth and Larson	September 1990
Thomas, Thompson, Chung, Barkmeyer, Carter, Templeton, Fox, and Hartman	September 1990
Litwin, Mark, and Roussopoulos	September 1990
Katz	December 1990
Barghouti and Kaiser	September 1991
McKenzie and Snodgrass	December 1991
Mishra and Eich	March 1992
Graefe	June 1993

Data Management and Organization

Bell, Witten, and Cleary	December 1989

Distributed and Cooperative Computing

Andrews	March 1991

Fault-Tolerant Computing

Abbott	March 1990
Barborak, Marek, Dahbura	June 1993

Graphics and Image Processing

Stytz, Frieder, and Frieder	December 1991
Suetens, Fua, and Hanson	March 1992
Hwang and Ahuja	September 1992
Brown	December 1992
Arman and Aggarawal	March 1993

Information Systems Applications	
Brancheau and Brown	December 1993
Networks: Distributed Computing	
Schneider	December 1990
Schneider	March 1993
Operating Systems	
Levy and Silberschatz	December 1990
Chin and Chanson	March 1991
Parallel Computing	
Norman, Thanisch	September 1993
Performance Modeling	
Onvural	June 1990
Nelson	September 1993
Programming Languages	
Bal, Steiner, and Tanenbaum	September 1989
Carriero and Gelernter	September 1989
Hudak	September 1989
Shapiro	September 1989
Programming Methods, Validation, Testing	
McDowell and Helmbold	December 1989
Krueger	June 1992
Brinch Hansen	June 1992
Shankar	September 1993
Simulation and Modeling	
Pawlikowski	June 1990
Theory of Computation	
Colbourn and van Oorshot	June 1989
User Psychology	
Hartson and Hix	March 1989